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ABSTRACT

Many researchers have begun to investigate possible predictors for the problems that beginning teachers may or may not face early in their career (often many of the problems faced are related to establishing and maintaining 'order' in the classroom). Two broad factors related to this problem were identified: (1) interpersonal aspect of teacher behavior; and (2) pedagogical-methodological aspect. This document focuses on the development of scientifically based guidelines concerning interpersonal teacher behavior in order to improve the quality of teacher education. Specifically, a model for interpersonal teacher behavior was operationalized in the form a questionnaire to determine the importance of physics teachers' communication style on student outcomes and attitudes. Suggestions are made to beginning teachers. (ZWH)

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THE INTERPERSONAL SIGNIFICANCE OF MOLECULAR BEHAVIOR OF SCIENCE TEACHERS IN LAB LESSONS: A DUTCH PERSPECTIVE

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Introduction

According to Créton and Wubbels (1984), many of the problems which beginning teachers face, are related to establishing and maintaining 'order' in the classroom. Créton and Wubbels identified interpersonal teacher behavior as an important factor for whether or not such problems actually arise. They distinguished between the interpersonal aspect of teacher behavior and the pedagogical-methodological aspect. The latter aspect refers to the procedures and the content of the lesson, whereas the interpersonal aspect is related to creating and maintaining a favorable working climate. Interpersonal teacher behavior was selected as the key concept within a Dutch research program of which the study described in this paper is a part. The aim of this program is to develop scientifically based guidelines concerning interpersonal teacher behavior in order to improve the quality of teacher education. Since 1980, educational researchers in the United States, Australia and Israel have joined in this research effort (Wubbels & Levy 1993).

One of the topics studied in this program was the importance of physics teachers' communication styles for student outcomes and attitudes (Brekelmans 1989, Brekelmans, Wubbels & Levy 1993). At the classroom level, communication styles

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of teachers turned out to be of major importance for both the students' achievements and their appreciation of the lessons and the subject taught.

To be able to formulate specific clues about actual behavior in the classroom which could help teachers to improve their communication with students, we directed our research efforts to the teachers' *molecular* behavior, i.e. their behavior observable during a brief time span in the classroom.

We start this paper with a description of our theoretical framework. Subsequently, we describe our research on the relation between perceptions of molecular teacher behavior and perceptions of teacher communication styles. The first part of this study was carried out in The Netherlands. In the second part of our study, which was carried out in Australia, we compared the perceptions of the teachers' molecular behavior in two different situations: firstly situations in which a teacher interacts with one or more individual students, for instance when working on lab-experiments, and secondly situations in which a teacher interacts with the class as a group, for instance when introducing experiments.

Theoretical framework

Many researchers who studied disorderly situations in the classroom, regard problematic student behavior as a characteristic of students (Doyle 1986). In our research however, we use a systems approach to communication (Watzlawick, Beavin & Jackson 1967; Wubbels, Créton & Holvast 1988). In this approach, behavior of an individual is not looked upon as a characteristic of a person, but as the characteristic of a communicative system that an individual forms together with others. When individuals communicate, their behaviors will mutually influence each other. For the situation in the class this means, that the teacher behavior is as much caused by the students' behavior as the other way around. This makes it for example easier to understand the phenomenon, that when one problematic student is sent out of the classroom, other students start behaving in a problematic way (Wubbels, Créton & Holvast 1988).

An important assumption of the systems approach to communication is that every form of behavior involves the communication of both a content and a relationship message (also referred to as the report and the command aspects of behavior). Teacher behavior such as pointing out student mistakes does not only carry the content of the words being used, but also an underlying relationship message. The message might be for instance: 'I want to help you to learn'. However, the relationship message of these words could be perceived in a quite different way if they are combined with different nonverbal behaviors, for example as: 'I think you are too stupid to learn' (from Marshall & Weinstein 1986). In studying the interpersonal behavior of teachers we focus on the relationship message.

A consequence of the assumption that *every* form of behavior communicates both a content and a relationship message, is the impossibility *not* to communicate in the presence of other people. An attempt at not communicating would be similar

to an attempt at not behaving. For instance, when teachers address students, it is obvious that they communicate, but when teachers keep silent in the presence of students, that behavior also communicates a message. The teachers' silence could be interpreted by students as evidence of the inability to talk to them, or as a signal that they have to be silent too, etc.

Within the system approach three levels of communication are distinguished. The lowest level is called the *message* level. A message consists of one single communication unit. Studying interpersonal behavior on the message level, implies studying the relationship message as it can be perceived from a single unit of behavior. An example: 'A teacher stands silent in front of the classroom. She continuously looks at the students.' The relationship message that can be perceived from this behavior, is that the teacher is very aware of the students behavior and therefore that the students should behave as this teacher wants them to, or risk punishment.

A series of messages exchanged between persons is called an *interaction*. The interaction level is the second level on which communication can be described. An example of an interaction: 'The teacher asks a specific student a question. The student, however, ignores the teacher. The teacher asks another student the same question, without paying any further attention to first student.' A relationship message that might be perceived from this teacher's behavior is that this teacher wants to avoid a confrontation with the student, and therefore, the students can determine their own activities without taking a very high risk of a confrontation with the teacher.

Because the individual's perceptions of the relationship messages of behavior are not only guided by their cultural knowledge, but also by their experiences in previous interactions, the longer individuals interact the more their behavior will become predictable. After a while the exchange of relationship messages will get a cyclic character. Action and reaction, cause and effect, are hard to distinguish in cyclic interactions. However, patterns can be identified in the exchange of relationship messages, and thereby the communications style of individuals in their mutual interaction also can be identified. For example: 'In a certain class, the students do not seem to take any notice of the teacher. Nevertheless, the teacher is almost always friendly and willing to assist the students.' The command of the communication style of this teacher can be described as uncertain and tolerant (Brekelmans 1989). Social systems in which the interaction proceeds according to such predictable patterns are relatively stable (Brekelmans 1989). The *pattern* level is the highest level of three successive levels on which communication can be studied.

To be able to describe the relationship messages communicated with teacher behavior, Hooymayers, Wubbels, Créton and Holvast (1982) developed the Model for Interpersonal Teacher Behavior (see Figure 1).

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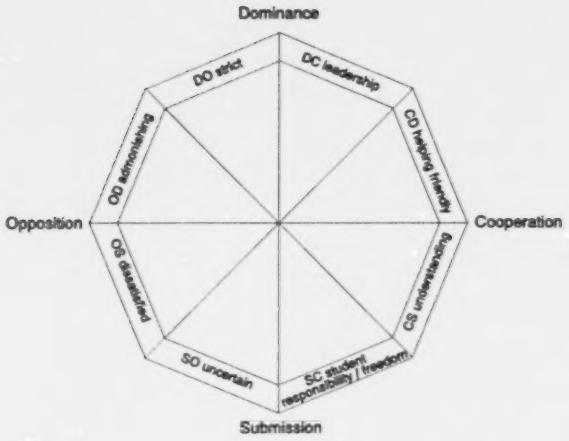

Figure 1: The model for Interpersonal Teacher Behavior

The model is an adaptation of a model developed by Leary (1957), which describes and measures specific interpersonal behaviors. In the model for interpersonal teacher behavior, relationship messages of teacher behavior are ordered on the basis of two dimensions. The dimensions are labelled Proximity (Cooperation-Opposition, abbreviated as CO) and Influence (Dominance-Submission, abbreviated as DS). These dimensions are both sufficient and necessary to describe the relationship messages of teacher behavior. According to Cappella (1985) similar dimensions are found in all research on interpersonal perceptions. The Proximity dimension designates the degree of cooperation, closeness or interpersonal warmth between those who are communicating. The Influence dimension indicates who is directing or controlling the communication, and how often. The two dimensions can be represented in a coordinate system divided into eight equal sectors. These eight sectors are labelled DC CD etc. according to their position in the coordinate system (much like the directions on a compass). The sectors describe eight different behavior aspects (see Figure 1). Every instance of interpersonal teacher behavior can be placed within this system of axes. The closer the instances of behavior are in the chart, the more they resemble each other (Wubbels, Créton & Hooymayers 1992).

The pattern level: teacher communication styles

Créton en Wubbels (1984) operationalized the Model for Interpersonal Teacher Behavior in the form of the Questionnaire on Teacher Interaction (QTI). The items in the QTI form eight scales that correspond to the eight sectors in the model. With the items, respondents are asked if specific statements apply to their teacher. Examples of items

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are: "This teacher is friendly" and "This teacher is strict". Items imply an evaluation of the teacher's communication style. Therefore, the QTI can be regarded as an operationalization on the pattern level of communication.

Because the statements in the items of the QTI refer to the teacher's behavior over a longer period of time, teachers and students have to know each other for more then two months to be able to answer the questionnaire (Brekelmans 1989). After a period of this length it does not seem to matter much in which period of the year the questionnaire is administered. However, the choice of the class in which the questionnaire is administered is important for the data on the communication style of the teacher. Several studies have been conducted on the reliability and validity of the QTI with satisfactory results. These studies included Dutch (Brekelmans, Wubbels and Créton 1990), American (Wubbels and Levy 1991) and Australian (Fisher, Fraser and Wubbels 1992) samples.

Not only are teacher communication styles a major indication of whether or not teachers are confronted with problems with 'order' in the classroom (Créton and Wubbels 1984), but they are also an important variable for teacher effectiveness in terms of student outcomes and attitudes. Brekelmans and her colleagues (Brekelmans 1989, Brekelmans, Wubbels & Levy 1993) studied the importance of students' perceptions of physics teachers' communication styles for both student achievement and attitude.

Achievement was measured with a standardized and internationally developed physics test[2]. Brekelmans *et al.* (1993) showed that 20 percent of the variance in student achievement is accounted for by school class membership. Three quarters of this variance (15 per cent of the total) is accounted for by student ability level. The remaining quarter (5 per cent) is the range in which teachers can make a difference. This means that student characteristics such as socio-economic status and previous achievement account for 50-80 per cent of their future achievement (e.g. Fraser, Walberg, Welch & Hattie 1987). The teacher's interpersonal style accounts for more than two thirds of the 5 per cent of variance which can be influenced by the teacher. In other words, teacher communication style accounts for a majority of the variance in the cognitive student outcomes which are open to teacher influence.

Attitudes, such as appreciation of the lessons and motivation for physics, were also measured by a questionnaire. Compared with other factors measured in this study (for instance the textbook used and teachers' opinions about education) the students' perceptions of the teacher communication style were once again the most important factor. It was found that school class membership accounted for 13 per cent of the variance in attitude scores. Students' perceptions of teacher communication styles accounted for more than two thirds of this variance.

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[2] The twenty-three-item test was one of the instruments used in the main part of the Second International Science Study (Pelgrum & Ten Bruggencate 1986).

Relation between the pattern and the message level of communication

The results of the research described above, encouraged us to search for specific clues about interpersonal teacher behavior that can help teachers to improve their communication with their students. Within the context of teacher education, it is important to be able to tell student teachers that their students perceive their communication style as for instance 'repressive' or 'tolerant'. Besides this, it is also important for teacher educators to be aware of the interpersonal significance of molecular teacher behavior and the potential impact of these suggestions on the students' perceptions of their teacher's communication styles, to be able to give fruitful suggestions to student teachers.

With the research described in this paragraph, we try to provide knowledge about the correlation of relationship messages communicated with molecular teacher behavior and the students' perceptions of their teacher's communication style and about the interpersonal significance of nonverbal teacher behavior in the classroom.

Part 1: the Dutch study

Twenty six student teachers were involved in the initial (Dutch) part of this research project. To gather data about the interpersonal significance of molecular behavior we videotaped one lesson of each of these student teachers. The recordings were made with a video camera positioned in the back of the classroom. In general, the camera was not zoomed in on specific interactions in the classroom. We used no extra microphones to record the teachers' conversations with individual or small groups of students. From each of these videotaped lessons, we selected three minutes on a time-sampling basis. These minutes were divided in six equal parts of eight seconds (we kept a two seconds interval between each of the fragments). In this part of the study we used a total of 468 fragments.

We asked trained judges to rate the interpersonal significance of the teacher behavior in each of these fragments. The ratings were given by means of scores on two Likert-type scales. These scales correspond to the two underlying dimensions in the model for interpersonal behavior: the influence dimension (DS) and the proximity dimension (CO). These rating scales are given in Figure 2.

Dominance (D) In this fragment the teacher determines the students' activities	5-4-3-2-1	Submission (S) In this fragment the students can determine their own activities
Cooperation (C) In this fragment the teacher shows approval of the students and their behavior	5-4-3-2-1	Opposition (O) In this fragment the teacher shows disapproval of the students and their behavior

Figure 2:The DS and CO rating scales

The judges rated the fragments from the point of view of an observer sitting in the back of the classroom, and estimated how the teacher was perceived by the students in the class. For each fragment they had considerations like: 'If I was a student in this class would I feel I could talk to my neighbor?' (for DS), or 'If I was a student in this class, would I feel the teacher is angry with us or does not like us?' (for CO) and then scored on the rating scales. To be able to compare the judges' ratings of the interpersonal significance of the teachers' molecular behavior with the students' perceptions of these teachers' communication style, we aggregated the judges' ratings to teacher means. These means give an indication of the level of the perception of the interpersonal significance of the molecular behavior. The interrater correlation of three independent raters was high (higher than $r = .90$ for the DS levels, higher than $r = .70$ for the CO levels). Because of these high correlations, we used one judge to rate all the 468 fragments in this part of our study. We gathered data about the students' perceptions of the teachers' communication styles, by administering the QTI in the classes of these teachers. We summarized the results of the QTI in DS and CO scores to be able to compare the students' scores on the QTI with the judge's ratings of the molecular teacher behavior.

We found that the level in the judge's ratings of molecular teacher behavior on the Dominant-Submission (DS) scale had a strong correlation (Cohen 1977) with the DS level in the students' perceptions of the teacher communication styles ($r = .48$). The DS ratings did not correlate significantly with the CO level in the students' perceptions. We found no significant correlation between the judge's Cooperation-Opposition (CO) ratings and the students' perceptions of teacher communication styles in terms of either DS- or CO levels.

In our previous research, we found that students' perceptions of teacher communication styles are an important indication for whether or not teachers are confronted with problems with order in the classroom (Créton & Wubbels 1984) and for teacher effectiveness in terms of student outcomes and attitudes (Brekelmans, Levy & Wubbels 1993). Since the DS ratings of the molecular teacher behavior are related to the DS level in the students' perceptions of teacher communication styles, knowledge about the actual teacher behavior observable in the classroom which influences these ratings, is important for the development of guidelines concerning interpersonal teacher behavior to be used within the context of teacher education. To be able to develop such guidelines, we investigated the impact of nonverbal teacher behavior observable in the classroom on the judge's DS ratings. In this study we used the same video fragments as in the initial part of this study. In addition, we also selected fragments in the same manner as described before from videotaped lessons of 27 more experienced teachers and one more student teacher. The total number of 972 fragments was rated by the judge according to the scales described in Figure 2.

Data about the teachers' nonverbal behavior in these fragments were gathered through the coding of these fragments according to an observation instruction. This instruction consists of 21 observation sets dealing with the various aspects of nonverbal behavior (Van Tartwijk, Brekelmans & Wubbels 1992, Van Tartwijk 1993). Each observation set contains at least four categories. The observer is asked to chose the most appropriate category from every set for the nonverbal behavior in each fragment. The data collected by means of these observation sets are combined in five multivariate constructs: the use of space, body movement and body position, facial expression, visual behavior, and the non-content aspects of speech (referred to as 'voice'). With these five constructs we are able to give a differentiated description of the teacher's nonverbal behavior. The next step was to find out how nonverbal behavior relates to the ratings of the interpersonal aspect of molecular teacher behavior. To do this we used a step-by-step reduction procedure, in which we reduced the large number of categories in each of the constructs of nonverbal behavior to a combination of just a few categories that were essential in explaining variance in the perceived interpersonal significance -i.e. the judge's ratings- of molecular teacher behavior.

All the constructs of nonverbal behavior were important in explaining variance in the DS ratings of molecular teacher behavior. In Table 1 we give the strongest significant correlations between the proportion of fragments in which a teacher showed specific behavior from each construct and the DS level in the rating of these fragments:

Table 1: The correlation between proportion of nonverbal behavior shown and the DS perception of molecular behavior

Construct	Proportion of	r
USE OF SPACE	frontal body orientation to the class & unable to touch students	.39
BODY POSITION & MOVEMENT	head upright and moving horizontally	.40
FACE	having a visible face	.42
VISUAL BEHAVIOR	looking uninterrupted at students	.56
VOICE	talking to students uninterrupted in a loud and clear voice	.72

Forms of nonverbal behavior which imply that the teacher scans the class (frontal body orientation, head upright and moving, visible face and looking uninterrupted at students) and which imply that the teacher has a strong verbal presence (talking to students uninterrupted in a loud and clear voice), appear to coincide with a stronger dominance perception of molecular behavior.

Several of the behaviors described in table 1 typically occur when a teacher is in front of the classroom and interacts with the class as a group[3]. To find out if the correlation between the rating of the molecular behavior as more dominant and the students' perception of the teacher communication style as more dominant could be attributed to differences in the frequency of teacher-class interactions, we scored for each of the fragments whether the teacher interacts with the class as a group, or with one or more individual students.

In 233 fragments selected from the lessons of 23 student teachers[4] about whom we had QTI scores available, the teacher interacts with the class as a group. When we only took those 233 fragments into consideration, we found a correlation of $r = .59$ between the DS ratings of the fragments and the DS level in the students' perceptions of teacher communication styles[5]. We found no significant correlations between the students' perceptions and the judge's ratings of the molecular teacher behavior in situations in which the teacher interacts with one or more individual students. We should note that the analysis is performed on data about 102 fragments taken from the videotaped lessons of only twelve student teachers[6]. This small N (number of student teachers) has important consequences for the power of the analysis.

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[3] The VOICE-behavior 'talking to students uninterrupted in a loud and clear voice', the USE OF SPACE-behavior 'frontal body orientation & unable to touch the students' and the BODY POSITION & MOVEMENT-behavior 'head upright and moving horizontally'.

[4] We only used the fragments of those teachers who interacted with the class in at least five of the 18 selected fragments to prevent the rating of only one or a few fragments from being overemphasized. This was the case for 23 of the 26 student teachers.

[5] We repeated the analysis described in Table 1 using the data from only those 539 fragments in which the teacher interacts with the class as a group. These fragments originate from the videotaped lessons of 49 of the original 54 teachers. Five teachers interacted in less than five of the available fragments with their class as a group. The results are given in Table 2.

Table 2: The correlation between proportion of nonverbal behavior shown and the DS perception of molecular behavior in fragments in which the teachers interact with their class

Construct	Proportion of	r
USE OF SPACE	frontal body orientation to the class & able to touch students	.31
BODY POSITION & MOVEMENT	not significant	
FACE	having a visible face	.39
VISUAL BEHAVIOR	looking uninterrupted at students	.56
VOICE	talking to students uninterrupted in a loud and clear voice	.48

The results given in this table imply that the correlation between nonverbal behavior and the DS ratings as described in Table 1 do not only reflect differences between molecular behavior in situations in which the teacher interacts with the class and situations in which the teacher interacts with one or more individual students. These nonverbal behaviors are also important for explaining variance in the DS ratings of molecular behavior in only those situations in which the teacher interacts with the class as a group.

[6] Only 12 of the 26 student teachers about whose communication style we gathered data with the QTI, interacted in five or more fragments with individual or groups of students.

Part 2: The Australian study

Of course, the lack of a significant correlation between the DS level in the students' perceptions of teacher communication styles and the DS ratings of the molecular behavior in situations in which the teacher interacts with individual students, can be attributed to the low power of the analysis. However, another explanation might be found in the character of our video recordings. We were not able to get a very detailed picture of the character of teacher-individual students interactions from the point of view of the individual students because we used one video camera positioned in the back of the classroom, we did not zoom in on teacher-individual student interactions and we did not use radiographic or aimable microphones.

We decided to replicate our study on the relation between the judge's ratings of the molecular behavior of teachers interacting with individual students and the students' perceptions of the teacher communication style, in such a way that the analysis would have a higher power. In this replication study, we videotaped the lessons of 33 in-service Australian science, physic and mathematics teachers. Because we wanted to compare teacher-class with teacher-individual students interactions, we selected lessons in which the teacher expected to assist individual or groups of students.

When making videotaping lessons, we paid more attention to the teachers' contact with individual students. The lessons were again videotaped from a position in the back of the classroom to disturb the lesson as less as possible, but when the teacher communicated with individual or groups of students the camera systematically zoomed in to record as many details as possible. Furthermore, we equipped the teacher with a small radiographic microphone to be able to record the conversations with individual or groups of students. We rated the interpersonal significance of the molecular teacher behavior in these fragments from the point of view of the student with whom the teacher was interacting.

From each of the 33 videotaped lessons we selected two minutes. One minute at the start of the lesson in which the teacher introduced or explained the subject to the class, and one minute -within this context on a time sampling basis- in which the teacher assisted individual or groups of students working on a specific assignment. Just as in our previous research each selected minute was divided in six equal parts of eight seconds with a two seconds interval between each of the fragments.

The fragments in which the teacher interacts with the class were again rated by a judge in the same way as the fragments in the Dutch part of our study were rated: from the point of view of an observer sitting in the back of the classroom, and estimated how the teacher was perceived by the students in the class. Ratings were given by scoring the fragments on the scales described in Figure 2.

To rate the fragments in which the teacher interacts with individual or groups of students, two new rating scales were developed. Again, these rating scales correspond with the dimensions in the model for interpersonal teacher behavior

(Hooymayers *et al.* 1982). These scales are given in Figure 3. The judges were asked to rate the fragments from the point of view of the individual students the teacher was communicating with, and to estimate how the teacher was perceived by these students. For each fragment they had considerations like: 'If I was this student, would i feel I could take the initiative?' (for DS), or 'If I was this student, would I feel the teacher is angry with me or does not like me?' (for CO) and than scored on the rating scales. The interrater correlations of the ratings of three independent raters was high ($r = .88$ or higher for both the DS level and the CO level in the ratings).

Dominance (D) In this fragment the teacher determines the cause of events and sequence in the interaction	5-4-3-2-1	Submission (S) In this fragment the student(s) determines the cause of events and sequence in the interaction
Cooperation (C) In this fragment the teacher shows interpersonal warmth	5-4-3-2-1	Opposition (O) In this fragment the teacher shows interpersonal coldness

Figure 3: The DS and CO rating for teacher-individual student(s) interactions

We gathered data about the students' perceptions of the teachers' interpersonal style, by administering the Questionnaire on Teacher Interaction (QTI) in the lessons of the 33 teachers. The questionnaires were numbered and administered to the students corresponding to a map of the class on which the seating position of each of the students was drawn. This made it possible to combine the student observable on the videotaped interactions with the scores of that particular student on the QTI. The students were assured that the researchers would be the only ones who would see the separate forms.

To determine the correlation between the ratings of the molecular teacher behavior when the teacher communicated with individual students, and the DS and CO levels in the QTI scores, we only used the mean QTI scores of the students with whom the teacher interacted in these six fragments. To determine the correlation between the DS and CO ratings of the molecular behavior when the teacher addresses the class and the DS and CO levels in the QTI scores, we used the mean QTI scores of all the students.

Just like in the Dutch study we did not find a significant correlation between the rating of molecular teacher behavior in those fragments in which the teacher interacts with individual or groups of students and these students' perceptions of teacher communication styles. Again, we did find a significant strong correlation ($r = .52$)

between the DS levels of the students' perceptions of the teachers' communication style and the DS level in the ratings of the judge of the molecular teacher behavior when the teacher interacts the class, just like in our previous research, we found no significant correlation between the DS level in these ratings and the CO level in students' perceptions of teachers' communication styles.

Discussion

In the research described in this paper, we focused on the relation between students' perceptions of teacher communication styles, which are formed during the first months in which a teacher communicates with these students, and the rating of the interpersonal significance of teacher behavior observed during just a few minutes of one lesson (i.e. the molecular teacher behavior). The results of both the Dutch and the Australian part of our study, support the conclusion that the DS level in the ratings of the molecular behavior of teachers who are interacting with their class as a group are an important indicator for the DS level in the students' perceptions of these teachers' communication styles. The results do not give any reason for continued research into the molecular behavior of teachers interacting with individual students with the aim to find indications for the students' perceptions of teacher communication styles.

A (hypothetical) explanation for the correlation between the DS level in the ratings of molecular behavior and the DS level in the students' perceptions of the teacher communication style, is that the position in front of the classroom functions as a kind of 'stage' where the students' perceptions of teachers' communication styles are formed or confirmed. Situations in which the teacher interacts with one or just of few students have a more 'back-stage' character (e.g. Goffman 1959). The latter situations maybe important for the perception of the teacher as a person but *not* for the perception of this person in his or her professional role as a teacher which is an important indication for student out comes and attitudes (Brekelmans, Wubbels & Levy 1993).

To identify actual behavior that correlates with higher DS levels in the ratings of molecular teacher behavior, we coded the teachers' nonverbal behavior. Those nonverbal behaviors that correlate highly with the DS level in the perception of the molecular teacher behavior, indicate that the teacher scans the class and that the teacher has a strong verbal presence.

Kounin (1970) states that the degree of the teachers' awareness of what happens in class ('withitness') and the degree in which the teacher scans several things at once ('overlapping'), correlate strongly with work involvement and freedom from deviancy. Research described by Cappella (1985) shows that the length of time for which people speak in relation to other people ('hold the floor') can be of great importance to the perception of those people as dominant.

The behavioral profile of the teacher whose verbal presence is accentuated and who keeps an overall view of things (visual scanning, Brooks 1985), is consistent with a stereotype image of a teacher who passes on information at class level. The dominance perception such behavior induces, could be used as an argument for a plea in favor of central class teaching methods, because -more than teaching methods in which pupils work autonomously- they offer the teacher the opportunity to steer the classroom climate in a direction they desire. Many education researchers abhor such teaching styles because they fail to stimulate pupils to engage in the activities that enhance the learning process (Westhoff 1993) and because they are in fact an important characteristic of a learning environment which pupils find discouraging (Matthijssen 1991). When pupils' own learning activities are stimulated by decentral working methods, the freedom offered to them might also stimulate them to engage in activities the teacher finds undesirable, and that (to put it less cryptically) can lead to discipline problems.

We think a fruitful suggestion to student teachers would be to put on a display of behaviors that brings on the image of a competent teacher *whenever* they address the class as a group: teachers capable of having an overall view of the going on in class and able to put their mark on the interaction in the class by their verbal presence, (e.g. by giving a clear instruction to pupils). By presenting themselves as a teacher with a dominant style at moments that they have a central position in the classroom interaction, these teachers probably create a (working) climate that reverberates, as it were, at times when pupils are working on assignments independently, for instance: the image that teachers project in the short periods that they address the pupils centrally, has the effect of the pupils submitting themselves to the rules (of order) drawn up by teachers at other times, without the teachers having to assert their competence (and power to enforce the set of rules) continually.

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